**Homework Week 34 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Number Properties & Q4 Interim Review Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pr: \_\_\_\_\_\_**

**This is a large homework assignment intended to guide you through a thought-process for number properties problems as well as review for the Quarter 4 Interim on Friday. You will have SOME time in class to work on this assignment, however a large part of completing this will come from you managing your time well and being responsible enough to work on the packet throughout the week. This homework assignment will be checked for an accuracy grade on Thursday. The following completion guide is suggested.**

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| **Monday night** | **Pages 1 – 4** |
| **Tuesday night** | **Pages 5 – 7** |
| **Wednesday night** | **Pages 8 – 10** |

**PART 1 – Number Properties**

In the problems below, you MUST show work at VERY least in the “Trial 1” box. (HINT: If there are 4 trials, you probably need to show work in each box.) You also MUST have work shown in the “Pattern/Explanation” box to explain your answer choice.

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| 1) Given a real number n such that |n| > n, which of the following must be true?  A. n < 0  B. n = 0  C. n = -n  D. n > |-n|  E. n > | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | |
| 2) If a > 0 and b < 0, which of the following statements is true?  a. a – b < a  b. a – b > a  c. a – b < b  d. a – b < 0 | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | |
| 3) If x and y are real numbers such that  and , then the minimum value for  is:  A. 0  B. 1  C. 2  D. 3  E. 6 | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | |
| 4) Two numbers are reciprocals if their product is equal to 1. If x and y are reciprocals and x > 1, then y must be:  A. less than -1  B. between 0 and -1  C. equal to 0  D. between 0 and 1  E. greater than 1 | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Trial 1:** | | **Trial 2:** | | **Pattern/Explanation:** | | **Trial 3:** | **Trial 4:** | | **Trial 5:** | |
| 5) Which of the following is FALSE for some x and y that satisfy the equation ?  A.  B. x = y  C.  D.  E. | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Trial 1:** | | **Trial 2:** | | **Pattern/Explanation:** | | **Trial 3:** | **Trial 4:** | | **Trial 5:** | |
| 6) If a > 0 and b < 0, which of the following statements is true?  a. b – a > a  b. b – a > 0  c. b – a > b  d. b – a < b | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | |
| 7) Two numbers are reciprocals if their product is 1. If m and n are reciprocals and 0 < m < 1, then n must be:  A. less than -1  B. between 0 and -1  C. equal to zero  D. between 0 and 1  E. greater than 1 | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Trial 1:** | | **Trial 2:** | | **Pattern/Explanation:** | | **Trial 3:** | **Trial 4:** | | **Trial 5:** | |
| 8) For nonzero numbers x and y, which of the following expressions is NOT equivalent to ?  A.  B.  C.  D.  E. | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Trial 1:** | | **Trial 2:** | | **Pattern/Explanation:** | | **Trial 3:** | **Trial 4:** | | **Trial 5:** | |
| 9) The expression  has the value 0 if and only if  A.  and  B.  and  C.  and  D.  and  E.  and | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Trial 1:** | | **Trial 2:** | | **Pattern/Explanation:** | | **Trial 3:** | **Trial 4:** | | **Trial 5:** | |
| 10) If a > 0 and b < 0, which of the following statements is true?  a. a + b > a  b. a + b < a  c. a + b > 0  d. a + b < 0  e. a + b < b | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | |
| 11) When is  defined?   1. Everywhere expect *x* = 4. 2. Everywhere except *x* = 4 and *x* = 3. 3. Everywhere except *x* = 2. 4. Everywhere except *x* = 2 and *x* = -2. | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | | **Trial 3:** | **Trial 4:** | |
| 12) For what values of x is it true that  ?  A. No values  B. Only values between 0 and 2  C. Only values between 2 and 4  D. Only values greater than 4  E. All values | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | | **Trial 3:** | **Trial 4:** | |
| 13) When is  defined? | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | |
| 14) Which of the following is not defined for all real numbers? | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | | **Trial 3:** | **Trial 4:** | |
| 15) What is the maximum value of 2a for a and b satisfying the system of inequalities below?    A. 1  B. 2  C. 8  D. 16  E. Cannot be determined from the given information | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | | **Trial 3:** | **Trial 4:** | |
| 16) If *q* is an even integer, which of the expressions results in an even integer?  (A) *q*(12) – 7       (B) 5 + 7*q*      (C) 5*q* – 3*q*       (D) 2*q*+ 3       (E) 4*q* + 1 | |  |  |  | | --- | --- | --- | | **Trial 1:** | **Trial 2:** | **Pattern/Explanation:** | |

**Challenge Problems: (YOU MUST SHOW WORK EVEN IF YOU DO NOT GET A FINAL ANSWER!)**

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| 17) | 18) Which of the following is true for all consecutive integers m and n such that m < n?  \*consecutive means numbers in order  A. m is odd  B. n is odd  C. n – m is even  D. n2 – m2 is odd  E. m2 + n2 is even |

**PART 2 – Interim Review Questions**

Show all work and write in complete sentences when necessary. Failure to do either will result in a LaSalle.

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| 19) Edna thinks that the cosine of for the right triangle below is . Explain why she is incorrect.  12  13  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 20) You are 50 feet from the screen at a drive-in movie. Your eye is on a horizontal line with the bottom of the screen and the angle of elevation to the top of the screen is 58°. Which of the following would find the height of the screen?     1. 50 cos 58 2. 50 tan 58 |
| 21) The Jones family was planning on taking a road trip from Chicago to Madison, WI, which is 500 miles. Instead, they decided to go to Springfield, IL, which is 670 miles from Chicago. On a certain map, each inch equals 50 miles. On that map, how much longer is the trip to Springfield than the trip to Madison? | 22) Two sides of rectangle WXYZ are 10 cm longer than the other two sides. If the perimeter of WXYZ is 100 cm, what is the area of the rectangle? |
| 23) A thumbnail of a photographer’s image shows a certain building to be 9 centimeters tall. In actuality the building is 700 meters tall. What is the scale factor of the building to the thumbnail? | 24)  Macintosh HD:Users:CarolineThai:Desktop:Screen Shot 2012-03-11 at 4.09.48 PM.png |
| 25) In standard (x, y) coordinate plane, DE has endpoint D (4, -6) and E (-4, -4). If the midpoint has the coordinates (x, y), what is x + y? | 26) Find the length of JK in the figure below. |
| 27) Brian is going to cover his kitchen with tiles, and he plans to put the tiles next to each other so there is no space in between them. The tiles are rectangular prisms that are 6 inches tall by 3 inches wide by 8 inches long. If Brandon’s kitchen is a square that measures 6 feet by 7 feet, what is the minimum number of tiles he will need to fully cover his kitchen floor? | 28) Joe’s T-shirt Shop sells custom t-shirts. Customers must choose one of three possible colors, whether they want long or short sleeves, and may choose to add any of three different quotations to the shirt or no quotation at all. If shirts are offered in small, medium, large, and extra-large, how many different combinations of shirts are there? |
| 29) At what point or points does the graph of  2x – 4y = 10 cross the x-axis? The y- axis? | 30) In both equations, solve for t. Use the hints to solve.   |  |  | | --- | --- | | a) Solve for t.  (Hint: distribute P first) | b) Solve for t.  (Hint: divide by P first) |   c) What was the difference between the equations?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 31) The triangle shown below is an isosceles right triangle. Find the measure of side length x. Leave your answer in radical form.    x  64 cm |
| 32) In the figure below, all angles are right angles.     1. Find the perimeter of the figure. 2. Find the area of the figure. | |
| 33) The area of an 8-foot-by-4-foot garden space is increased by 3 times. If the 8-foot side is increased by 4 feet, how many feet must the 4-foot side have been increased?   1. 3 feet 2. 4 feet 3. 8 feet 4. 12 feet 5. 96 feet | 34) A park wants to put a fence around a baseball field in the shape below. Each straight side of the fence is 150 feet long, and the rounded side is an arc that measures 90. How many feet of fencing does the park need to purchase?    Exact\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Approximate\_\_\_\_\_\_\_\_\_\_\_\_ |
| 35) If one diagonal of a rhombus is 24 cm and the other is 70 cm, how long is each side of the rhombus? | 36) If Quadrilateral 1 has congruent diagonals, and Quadrilateral 2 has all sides the same, which of the following must also be true?   1. Both shapes are rectangles 2. Both shapes are rhombuses 3. Both shapes are squares 4. II only 5. III only 6. II and III only 7. I, II, and III |
| 37) A square and a semicircular region have the same perimeter. If the length of the radius of the semicircular region is 4 cm, what is the length of one side of the square in cm?  Exact\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Approximate\_\_\_\_\_\_\_\_\_\_\_\_ | 38) In the figure below, ABCD is a square. Points on each pair of adjacent sides of ABCD are connected to form 4 congruent right triangles with one leg four times as long as the other, as shown below. What fraction of the area of square ABCD is shaded?  A  B  4x  x  C  D |
| 39) The area of the face of a cube is 81 square inches. What is the volume of that cube? |